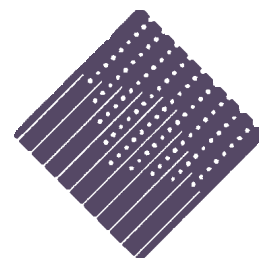


# RESEARCH and DISCOVERY

*Advances in Behavioral and Social Sciences Research*



**OBSSR**

## Study Reveals Critical Role of Peers in Youth Violence

Since the 1920s, research has shown that delinquent children frequently associate with delinquent peers. Yet a causal link between socializing with deviant peers and the development of deviant behavior had not been established. That is, do peers socialize adolescents in a way that leads to deviance, or do adolescents who exhibit deviant behavior seek out others who also engage in those activities?

Now, recent findings from the National Youth Survey (NYS), the first major long-term study of violent offenders to use a nationally representative sample, are providing convincing evidence that the stability of aggressiveness and violence over time is due more to the nature of social relationships and other social contextual factors than to some underlying individual predisposition. In fact, the association with deviant peers remains one of the strongest factors influencing delinquency. One of the more dramatic findings of the NYS was that association with delinquent peers precedes the initiation and progression to serious violent offenses in 90% of cases. The study data also indicate little to no substantive race difference in the propensity for violence.

The principal investigators, Delbert Elliott and David Huizinga, from the Center for the Study and Prevention of Violence at the University of Colorado, found three primary factors that predict the onset of serious violence—association with delinquent peers, attitude toward deviance, and normlessness. Weaker factors include peer

sanctions and early exposure to violence. While parental influence is very important through childhood or grade school, during puberty, acceptance by peers becomes dominant, and the peer group forms the critical social context for crime.

*continued on page 4*

## Therapeutic Foster Care Reduces Juvenile Criminal

In a study funded by the National Institute of Mental Health (NIMH), Patricia Chamberlain of the Oregon Social Learning Center demonstrated the success of therapeutic foster care for multiple-offending male delinquents. Dr. Chamberlain's study was strongly influenced by the findings of Delbert Elliott and David Huizinga (see "Study Reveals Critical Role of Peers in Youth Violence"). "Their findings very clearly implicate delinquent peers as the key variable in delinquency," explained Chamberlain. "Juvenile offending is a group activity. Therapeutic foster care takes a kid away from the peer group dynamic and drops him into a family where adults are in charge."

The 5-year study involved the random assignment of 79 males, ages 12 to 18, who had been court ordered to out-of-home placements in the Eugene, Oregon, area. The subjects had an average of 14 prior criminal arrests, including four felonies. Half the subjects were randomly assigned to the usual care arrangements that place offenders with

*continued on page 2*

*Winter, 1998*

Theme of  
This Issue:

## Violence Research

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## From the Director's Desk...

It is with pleasure that I introduce the first issue of *Research and Discovery: Advances in Behavioral and Social Sciences Research*. This newsletter is designed to better inform the NIH community, the general public, and policy makers about scientific developments in NIH-supported behavioral and social sciences research. Each issue will feature a research theme that cuts across the boundaries of NIH institutes and scientific disciplines, often highlighting the intersection of sociobehavioral and biomedical research. Thus, it is my hope that *Research and Discovery* will serve as a catalyst for increasing interdisciplinary and trans-institute research activities at NIH.

In July of this year, OBSSR celebrated its third anniversary. The Office has made much progress toward meeting its three strategic goals: 1) enhancing behavioral and social sciences research and training; 2) integrating a biobehavioral, interdisciplinary perspective across NIH; and 3) improving communication among health scientists and with the public. We believe that the overall mission of NIH, to improve the health and well being of people, can be greatly enhanced through increased attention to behavioral and social sciences research and how these areas converge with biomedical fields.

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### Publication Information:

Editor: Norman B. Anderson, Ph.D.  
Issue Editor: Susan Solomon, Ph.D.  
Managing Editor: Susan Persons, M.A.

Website: <http://www1.od.nih.gov/obssr/obssr.htm>  
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## Criminal Behavior *continued from page 1*

similar histories together, and the other half were assigned to therapeutic foster care. Therapeutic foster care is an enhanced version of foster care where foster parents receive substantial training in behavior monitoring, consistent discipline, and positive reinforcement. Typically, the placements lasted 6 to 7 months. "Supervision, structure, consistency, discipline, and reward are key elements in successful treatments," Chamberlain explained.

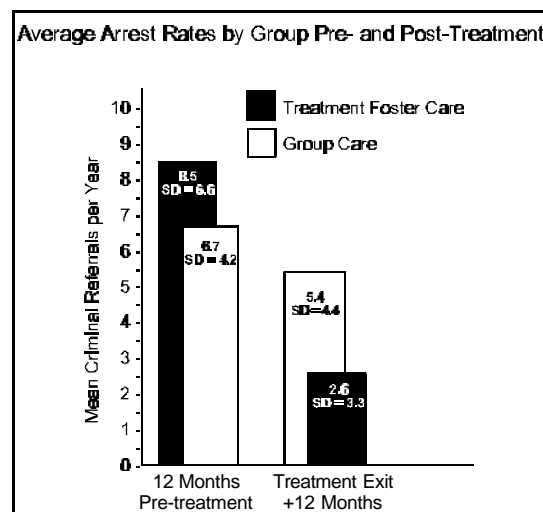
Chamberlain's study is one of the few that has scientifically demonstrated a successful intervention for teenagers with an established pattern of serious and chronic delinquency. In comparison to the usual group care arrangements, therapeutic foster care was found to result in half as many self-reported offenses, fewer runaways, and half the

number of arrests at 18 months following placement (See Figure 1). While other programs targeting this population have failed to produce lasting results, the foster care treatment was able to sustain its positive effects, with reductions in serious delinquency continuing for at least one year after the intervention ended.

In addition to successful intervention, therapeutic foster care demonstrated a significant cost savings. Compared to routine group care, therapeutic foster care is approximately \$2,000 less per month. An independent cost-benefit analysis conducted by the Washington State Institute of Public Policy found that boot camps—the program of choice in many states for adolescents exhibiting serious criminal behavior—have a negative cost-benefit ratio. Boot camps incurred an additional \$7,910 cost to taxpayers and crime victims per offender, as compared to a no-treatment group. Youths graduating from these camps actually average MORE felony convictions by age 25 than youth offenders not exposed to the boot camp program. In contrast, Washington State estimated that Chamberlain's program saves taxpayers and victims \$17,600 for each therapeutic foster care graduate, as a result of both substantially greater efficacy and lower program cost.

The study has profound implications for intervention with youthful offenders. At-risk and delinquent youths should not be grouped together during treatment. On the contrary, they should be isolated as much as possible from each other, while their interaction with pro-social youth and trained caretaking adults should be maximized. Biological parents should be trained in behavior management skills and provided support as well.

**Figure 1**



# OBSSR Collaborates on Violence Research

To enhance behavioral and social science research and training—the first of its three strategic goals—OBSSR is organizing a series of trans-NIH and interagency requests for applications (RFAs) and program announcements. The first RFA, announced in January 1996, focused on violence against women and violence within the family. The RFA encouraged research on the abuse of children and the elderly, partner violence, sexual violence, and multiple episodes of family violence.

The initiative represents the first interdepartmental and trans-NIH funding program on violence and brings together many different perspectives. The program was coordinated by OBSSR and co-sponsored by the Office of Research on Women's Health, the Office of Research on Minority Health, the National Institute on Drug Abuse, the National Institute on Alcohol Abuse and Alcoholism, the National Institute on Mental Health, the National Institute on Aging, the National Institute of Justice, the National Center on Child Abuse and Neglect, and the Centers for Disease Control and Prevention.

The synergy of the interagency effort attracted new and important applications that combined populations at risk, outcomes, programs, and researchers in a way not previously seen in any single-organization solicitation. The following is a list of 10 grants funded from the RFA pool:

*Children of Battered Women: Reducing Risk for Abuse.* Dr. Ernest Jouriles, P.I., University of Houston, Houston, TX.

*Protection of Women: Health and Justice Outcomes.* Dr. Marsha E. Wolf, P.I., Harborview Injury Prevention and Research Center, Seattle, WA.

*Domestic Abuse Among Latinos: Description and Intervention.* Dr. Julia Perilla, P.I., Georgia State University, Atlanta, GA.

*Maltreated Children's Emotions and Self-Cognition.* Dr. Michael Lewis, P.I., UMDNJ-Robert Wood Johnson Medical School, Piscataway, NJ.

*Understanding Partner Violence in Native-American Women.* Dr. Lorraine Malcoe, P.I., University of Oklahoma, Oklahoma City, OK.

*Intervention for Abuse of Aging Caregivers.* Dr. Linda Phillips, P.I., University of Arizona, Tucson, AZ.

*Risk Factors for Homicide in Violent Intimate Relationships.* Dr. Jacquelyn Campbell, P.I., Johns Hopkins University, School of Nursing, Baltimore, MD.

*The Effects of Community Violence on Women and Children.* Dr. Lourdes Linares, P.I., Boston City Hospital, Boston, MA.

*Prevention of Post-Rape Psychopathology in Women.* Dr. Heidi Resnick, P.I., Medical University of South Carolina, Charleston, SC.

*Treatment of Violent Adolescent Males from Abusive Homes.* Dr. Kathleen Malloy, P.I., Wright State University, Dayton, OH.

## Violence and Minority Youth

The National Institute of Child Health and Human Development (NICHD), with funding from the Office of Research on Minority Health, has initiated a research program for the prevention of violence and other risky behaviors in minority youth. A set of eight projects currently underway focuses on strategies for decreasing violence-related injuries and deaths, sexually transmitted diseases, and unwanted or unintended pregnancies in minority youth, ages 10-18.

Recognizing that didactic education about risky behavior is insufficient for achieving behavior change, the goals for the NICHD interventions reach beyond the delivery of information to help young people develop and practice skills in decision making, conflict resolution, and reducing their own risks of unhealthy outcomes. Role playing, video creation, interviews of respected community members, and custom-designed computer games are ways in which the interventions are implemented. Classroom teachers, community leaders, and trained health educators and peers will lead the interventions. Parents are also eligible to participate in special programs designed for them at most of the sites.

## Events Calendar

Seminar: *The Emotional Brain: Emergence of Affective Neuroscience*, Richard Davidson, February 18, 1999, 3:00-4:00 p.m., NIH, Natcher Conference Center, Balcony A  
Contact: Dr. Ron Abeles (301) 594-5943

Seminar: *Genetic Epidemiology: Implications for Behavioral and Social Approaches to Disease Prevention*, Kathleen Merikangas, March 29, 1999, 3:00-4:00 p.m., NIH, Natcher Conference Center, Balcony A  
Contact: Dr. Ron Abeles (301) 594-5943

Seminar: *Successful Intelligence*, Robert Sternberg, April 15, 1999, 3:00-4:00 p.m., NIH, Natcher Conference Center, Balcony A  
Contact: Dr. Ron Abeles (301) 594-5943

Seminar: *Positive Illusions, Mental Health, and Physical Health*, Shelley Taylor, May 13, 1999, 3:00-4:00 p.m., NIH, Natcher Conference Center, Balcony A  
Contact: Dr. Ron Abeles (301) 594-5943

Seminar: *Prevention of Depression and Positive Psychology*, Martin E. P. Seligman, June 17, 1999, 3:00-4:00 p.m., NIH, Natcher Conference Center, Room E1-E1  
Contact: Dr. Ron Abeles (301) 594-5943

Seminar: *Indicators of Child and Family Well-being: The Good, the Bad, and the Ugly*, Kris Moore, July 22, 1999, 10:00-11:00 a.m., NIH, Natcher Conference Center, Balcony A  
Contact: Dr. Ron Abeles (301) 594-5943

## Youth Violence *continued from page 1*

The NYS, funded by National Institute of Mental Health, is a prospective longitudinal study with 1,725 male and female participants, ages 11 to 17, when the study began in 1976. Nine waves of data are available on this youth panel, age 27 to 33, when last interviewed. Each wave of data collection included both extensive confidential interviews to collect self-reported serious violent offenses and checks of official records of law violations. "Before our study, there were no systematic, uniform, self-reported data collection studies on crime," stated Delbert Elliott. "The best data available were arrest records, but those data greatly underestimate the prevalence of involvement in violent behavior because they reflect only behaviors to which police respond."

Unlike findings from earlier studies using official records, Elliott and Huizinga's study found that minor forms of delinquent behavior typically precede serious forms of violence. The self-report data showed that aggravated assault precedes robbery in 85% of cases and rape in 92%. Robbery precedes rape in 72% of cases. The sequence suggests a clear escalation in the seriousness of criminal behavior.

The age distribution of serious violent offenders (SVOs) shows that involvement in serious violent behavior is primarily an adolescent-early adult phenomenon (See Figure 2). Over half of all violent offenders initiate their violence between ages 14 and 17, though many begin as young as age 12. The risk of initiation after age 20 is close to zero. Thus, SVOs are most prevalent during adolescence when peer pressure is the strongest.

The findings for race reveal an extremely different picture than previous studies have shown. The earlier studies relied on official arrest records, and these studies showed that black adolescents were arrested at three to six times the rate of whites (See Figure 3). However, the NYS, which used measures of cumulative prevalence of actual behavior rather than arrests, supports a much smaller black to white differential in onset—a ratio of five to four. Thus, the self-reported data indicated little substantive race difference in the propensity for violence.

Interestingly, while race does not substantively affect the onset of violence, it appears to be related to continuity once an individual becomes involved. Nearly twice as many blacks as whites continue their violent careers into their twenties.

Closer scrutiny suggests that these differences in continuity may be largely accounted for by the differing experiences of blacks and whites as they enter young adulthood.

While no differences in

continuity rates exist for blacks and whites who are employed between ages 18 and 20, such differences do persist for unemployed persons. Similarly, no differences in continuity rates are found between blacks and whites living with a spouse or partner, but differences exist for those living by themselves or in other arrangements.

These data support the maturational reform hypothesis that transition into responsible adult roles leads to avoidance of violent behavior and crime. Elliott hypothesizes that the black continuity rate is higher because young people from disadvantaged families and neighborhoods have fewer opportunities to acquire conventional adult roles and are more deeply embedded in social and economic networks of delinquents, such as gangs. Because blacks encounter more difficulty in acquiring adult social status, they more frequently remain stuck in violent roles and behaviors that characterize adolescence.

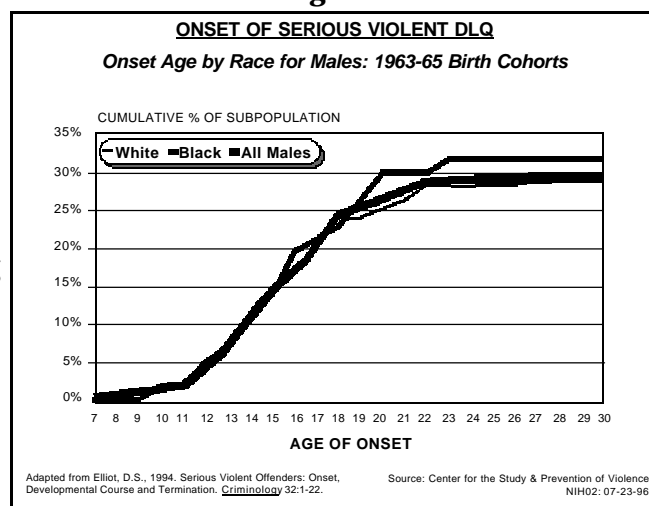
Elliott and Huizinga's work holds two major implications for the design of anti-violence policy and interventions. First, the timing of interventions is key. "Interventions must be timed to target the onset of violent behaviors during adolescent years," stated Elliott. Second, interventions must target the peer group as the key influencing factor (see "Therapeutic Foster Care Reduces Juvenile Criminal Behavior," on p.1). "Programs that bring delinquents together may unintentionally enhance the reciprocal relationship between

deviant peers and deviant behavior," Elliott said.

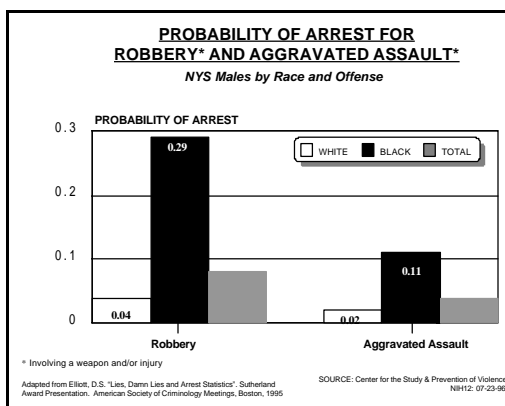
The most recent analyses of the NYS data do not support a bright future. "We've done some comparisons of the drop-off in violence after the peak age among teens in the early 1980s versus teens in the early 1990s," explained Elliott. "The maturation effect isn't happening as soon. This suggests more

continuity and increased violent career length." The trend suggests that traditional interventions are not working and new strategies must be supported.

**Figure 2**



**Figure 3**





# Elder Mistreatment

For the most part, the problem of elder abuse has been a hidden one. Although all forms of abuse are significantly underreported, studies suggest that elder abuse may be particularly so. According to a survey of states by the Subcommittee on Health and Long-Term Care, it has been estimated that while one out of three child abuse cases is reported, only one out of every eight cases of elder abuse is reported. Though states have passed laws requiring professionals to report elder abuse, these laws are unevenly enforced. One incidence estimate by the National Aging Resource Center on Elder Abuse is that nearly 1.57 million older people were victims of elder abuse during 1991. Though huge, this number is likely an underestimate, and the number is certain to grow as the population ages.

Despite the magnitude of this problem, elder abuse has received scant research attention until quite recently. To address this need, the National Institute on Aging has funded several studies on elder abuse. Among the more interesting and potentially important is an ongoing study which is examining 15 years of retrospective data from the Established Populations for Epidemiologic Studies of the Elderly (EPESE) to determine the risk factors for elder mistreatment. The sample consists of 2,811 community-living elders in New Haven, Connecticut. The study, led by Mark Lachs, provides for a collaborative effort between academic institutions, the New Haven community, and the local police force.

The city of New Haven affords a unique opportunity because Connecticut has the oldest law for mandatory reporting of elder mistreatment. Using EPESE, it is possible to identify elders who were interviewed annually with standardized assessments of medical, functional, and psychosocial health, and who were later found to have sustained elder mistreatment through mandatory reporting. The yearly assessments provide baseline data prior to the report of victimization and an identical assessment immediately after the victimization event.

The original longitudinal study permits identification of a control group of elders in the cohort who were not victims of abuse. Thus, this unique study sample allows differential changes in health and functioning to be validly attributed to the abuse event, while confounding variables, such as comorbidity, can be excluded. In addition, the initial population was oversampled for minorities. Since little is known about elder abuse and racially diverse populations, the study will provide insight into this key area.

Initial results from pilot studies revealed that 7.4% of the cohort have been referred to Adult Protective Services, three-fourths for "self-neglect." Lachs is testing the hypothesis that cognitive and functional decline will be powerful predictors of elder mistreatment. In addition, older age (over 75), poor social networks, and being nonwhite, are factors predicted to be associated with the risk of elder abuse.

The long-term objective is to develop and implement physician-initiated interventions, based on remediable risk factors. Planned projects include a detailed study of elder mistreatment outcomes, a clinic-based randomized clinical trial of elder mistreatment prevention based on identified risk factors, and a case control study of noncognitive symptoms of dementia as risk factors for elder mistreatment. As the population ages and the number of older adults at risk for abuse, neglect, self-neglect, exploitation, and abandonment increases, findings from these projects will offer physicians much needed assistance in recognizing and preventing elder mistreatment.

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## NIH Focuses on Child Abuse and Neglect Research

In response to a Congressional mandate, NIH has established a trans-NIH Child Abuse and Neglect Working Group (CANWG) comprised of representatives from most NIH institutes and OBSSR. With participation from other federal agencies, CANWG meets regularly to review NIH research efforts in child abuse and neglect, identify accomplishments and future research needs, and coordinate child abuse-related research efforts.

To encourage more research in child neglect, CANWG is exploring the possibility of a trans-NIH request for applications and follow-up program announcement, in partnership with other Federal agencies. Other projects included a CANWG conference held in March 1998 to develop common definitions and a classification of abusive physical injuries. In addition, CANWG is undertaking several activities aimed at developing investigators to study child abuse and neglect, including summer workshops to train:

- (1) experienced NIH investigators from related fields about abuse and neglect research, and
- (2) child abuse researchers in the art of applying for NIH grants. Also under discussion is a program announcement for interdisciplinary awards to young investigators.

# Mothers' Alcohol Abuse Connected to Children's Victimization

**B**renda A. Miller and colleague Nancy J. Smyth recently completed a longitudinal study, supported by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), that investigated the levels of violence experienced by children whose mothers have alcohol problems. The extent to which the mother's alcohol problems related to her ability to protect her children from being victims of violence by others was also examined. The recent study, "Mother's Alcohol Problems and Children's Victimization," built on a previous project funded by NIAAA, "Impact of Family Violence on Women's Alcohol Problems."

The more recent study drew from the same sample of women interviewed in the earlier project. The women were identified from five sources in western New York—outpatient alcoholism clinics, classes for first-time drinking and driving offenders, shelters for battered women, outpatient mental health clinics, and households obtained through random digit dialing. Two-hour, face-to-face, structured interviews were conducted with 203 mothers who had children aged 3 years or older. A total of 106 adult children were also interviewed.

The project examined two issues—(1) the relationship between mothers' alcohol problems and their use of violence or physical punitiveness, and (2) the impact of mothers' alcohol problems on their level of protectiveness and children's victimization experiences. These interrelationships are complex, and both mother and child characteristics and behaviors were found to influence the nature of the relationships.

Data from mothers of young (ages 3 to 17 years) and adult children were found to show that punitiveness and child abuse potential were significantly higher among mothers with an alcohol problem history compared to mothers without alcohol problems. The positive relationship remained significant after controlling for confounding factors such as

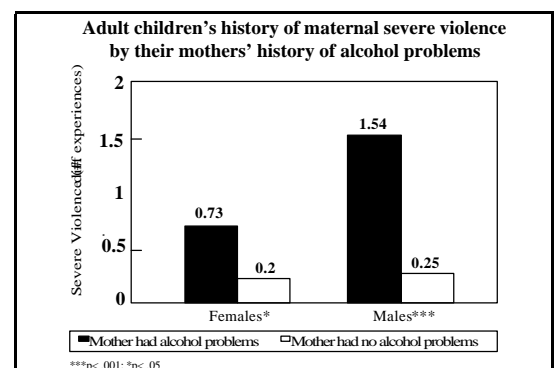
mother's age, child's age, and socioeconomic status. While children's attention problems, activity level, rigidity, temperament, and anxious or depressed behaviors were found to be important intervening variables, the direct effect of mothers' alcohol problems in predicting mother-to-child violence remained significant after controlling for child characteristics and behaviors (See Figure 4).

Other analyses confirmed that mothers' alcohol problems also affect their ability to protect their children from violent victimization by others. The data from mothers of young children indicated that mothers with a history of alcohol problems report a greater likelihood of partner-to-child verbal abuse, and their children are at a greater risk of partner-to-child physical abuse. Further, a significantly greater percent of adult female children reported childhood sexual abuse if their mother had alcohol-related problems.

The level of protectiveness that mothers exhibited toward their children was found to influence the level of delinquency of their children. The more mothers monitored their children's behavior, the less likely their children were to be delinquent. In turn, children's ability to concentrate affected their victimization experiences and their mothers' protectiveness and alcohol abuse.

Because many women originally identified as problem drinkers had stopped drinking during the study, Brenda Miller's future work will prospectively investigate whether mothers' current problem drinking and decreases in their current drinking affect their punitiveness and protectiveness. A better understanding of this relationship will lead to more effective interventions for childhood violence and alcohol problems in women.

**Figure 4**



*Other analyses confirmed that mothers' alcohol problems also affect their ability to protect their children from violent victimization by others.*

## From the Director's....

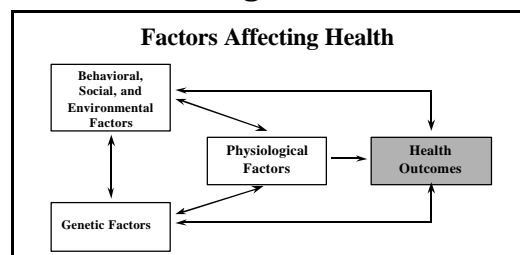
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For those of you who have not yet had the opportunity to become acquainted with our office, I encourage you to do so. Our website at <http://www1.od.nih.gov/obssr/obssr.htm> contains substantial information about the office's mission, activities, and accomplishments, as well as additional summaries of scientific advances.

The guiding philosophy of the OBSSR is that scientific advances in the understanding, treatment, and prevention of disease will be accelerated by greater attention to behavioral and social factors and their interaction with biomedical variables. Figure 5 illustrates the various factors that determine health outcomes, which involve behavioral, sociocultural, environmental, physiological, and genetic factors, and the interactions among these categories. Although the contribution of each category may vary from disease to disease, there is now ample evidence supporting this integrated perspective of causation for most health problems.

The NIH has had a long and revered tradition of funding research in the physiological realm; and more recently, there is tremendous excitement in the realm of genetics research. But equally important is the role that behavioral, psychological, sociocultural, and

**Figure 5**



environmental factors play in health. Our beliefs, our emotions, our behavior, our thoughts, our family and cultural systems, as well as the environmental context in which we live, are all as relevant to our health as our genetic inheritance and our physiology.

The conceptualization of health illustrated in Figure 5 may be applied to an array of disorders including heart disease, cancer, diabetes, AIDS, depression, substance abuse, stroke, asthma, injuries, anxiety disorders, chronic pain, infant mortality, and dental problems. Furthermore, the categories outlined in Figure 5 represent not only risk factors for disease, but identify targets for intervention. Although most of our treatment research efforts have been aimed at the

physiological category using drug interventions, research clearly demonstrates the efficacy of behavioral and social interventions for a large number of disorders. Therefore, a vision for the OBSSR is that through its work, this broader conceptualization of health will be used to guide the scientific mission of the NIH.

The theme of this first issue of *Research and Discovery* is the problem of violent behavior, one of the most troubling problems facing society today. Behavioral and social sciences research funded by NIH and other agencies is making progress in helping us understand and ameliorate this critical health problem. While many institutes are involved in the funding of research in violence, including NIMH, NICHD, NIDA, NIAAA, NIA, NINR, and NIGMS, space limitations permit us to feature only examples of grants funded by those institutes with the largest portfolios.

This issue of *Research and Discovery* highlights the diversity of topics in violence research funded by NIH. Topics ranging from parental influences, peer relations, age, gender, socioeconomic status, biological functioning, and substance abuse play key roles in our understanding, treatment, and prevention of violent behavior.

I hope you will find the research reported here both enlightening and stimulating. Please know that I welcome your comments regarding the science highlighted in this newsletter, as well as any suggestions for future topics.

Norman B. Anderson, Ph.D., Director, OBSSR, NIH

## Women, Drugs, and Homicide

The National Institute on Drug Abuse has funded a project examining the relationship between drug use, the distribution of drugs, and female perpetrated homicide. Researcher Barry J. Spunt and colleagues at the John Jay College of Criminal Justice, City University of New York, interviewed 215 female offenders who were convicted of homicide in New York City. The interviews focused on the life histories and robbery and assault events for which participants were incarcerated. Questions were designed to evoke the contextual, situational, and individual factors that characterize the sociocultural processes associated with drug use/distribution relationships.

Since current data indicate that female violent crime and female drug use/distribution have both increased, investigators examined the participants' drug use prior to and at the time of the homicide, their victim's drug use, and their perceptions as to the drug relatedness of the homicides. Preliminary results revealed that 70 percent of the women had been regular drug users at some point in their lives prior to incarceration, and over half had been addicted to a substance. Almost two-thirds of the homicides committed by the women were perceived to be drug related. The majority of female drug-related homicides are due to the ingestion of drugs, followed by homicides committed in the act of drug trafficking. Alcohol, crack, and powdered cocaine were the drugs most likely to be related to these homicides.

Despite the difficulty of generalizing these findings to all women who commit homicide, Spunt concludes that "self reports have greater utility than existing criminal justice records for helping gain insight into the ways that drug involvement and homicide are related for women. Self-report data should also be useful for drug misuse and criminal justice professionals to help them develop new program initiatives for drug-involved women who engage in violence."

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## OBSSR Briefs NIH Director Harold Varmus

**A**s Director of the OBSSR, Dr. Norman Anderson serves as the principal advisor to the NIH director, Dr. Harold Varmus, on matters concerning behavioral and social sciences research. In this role, Dr. Anderson keeps Dr. Varmus informed on important developments in sociobehavioral research funded by the NIH. Over the last three years, Dr. Anderson has arranged special scientific briefings for Dr. Varmus with leading behavioral and social scientists to learn about their research.

One recent briefing was conducted by Dr. Lisa F. Berkman, Norman Professor and Chair of the Department of Health and Social Behavior at Harvard School of Public Health. Dr. Berkman discussed her research, which

documents, in prospective longitudinal studies, the relationship between close social ties (often called "social support") and risk for all-cause mortality. Her research is now uncovering numerous pathophysiological mechanisms that might account for these relationships. "The extent to which we maintain close personal relationships, or the degree to which we feel rooted in our community or have deep, abiding social and psychological resources, help to determine how protected we are against biological, environmental, or interpersonal assaults," she said.

For further reading about Dr. Berkman's research, please see the following articles:

Berkman, LF; Syme, SL: Social networks, host resistance, and mortality: a nine-year follow-up study of Alameda County Residents.

*Amer. J. Epidemiology* 109(2): 186-204, 1979.

Berkman, LF; Leo-Summers, I; Horwitz, RI: Emotional support and survival after myocardial infarction: a prospective, population-based study of the elderly. *Annals of Behavioral Medicine*, 117(12): 1003-1009, 1992.

Berkman, LF: Social networks, support, and health: taking the next step forward. *Amer. J. Epidemiology* 123(4): 559-562, 1986.



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